

**REMARKS**

Claims 1, 10, 20 and 32 are amended herein. Claims 1-34 remain pending in the application.

**Claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 over Yeap**

In the Office Action, claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Yeap et al., U.S. Patent No. 6,052,420 ("Yeap"). The Applicants respectfully traverse the rejection.

Claims 1 and 3-5 recite, *inter alia*, an AM interference canceller that outputs a signal representative of AM interference to a hybrid. Claims 10 and 12-14 recite, *inter alia*, a hybrid summer to combine a signal destined for input to an DSL receiver with an output of an AM interference canceller module. Claims 20-23, 25, 32 and 33 recite, *inter alia*, combining a generated AM interference replica signal with a digital subscriber line signal at a hybrid.

Yeap appears to disclose a noise suppression circuit for a two-wire communications channel (Abstract). Common mode noise is estimated by adding an in-phase TIP signal and an anti-phase RING signal in a twisted pair cable with respect to ground reference (Yeap, col. 6, lines 7-9). Within a noise estimator, the common mode signal is filtered in an adjustable bandpass filter band and phase inverted by an adjustable inverter unit (Yeap, col. 6, lines 16-18). The control unit controls an adjustable gain unit so as to adjust the amplitude of the noise estimate signal to an approximate level to cancel the differential mode noise in the differential mode signal (Yeap, col. 6, lines 46-49). A hybrid outputs a differential mode signal to a summer, the summer summing the differential mode signal with the noise estimate signal to cancel the differential mode noise (Yeap, Fig. 2).

Yeap discloses a summer that combines a noise estimate signal with a differential mode signal produced by a hybrid. Yeap fails to disclose a noise cancellation signal presented to a hybrid that sums a cancellation signal,

much less an AM interference cancellation signal, as recited by claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33.

An advantage of canceling AM interference at a hybrid circuit is, e.g., elimination of interference prior to further signal processing. As disclosed by Yeap, a hybrid outputs a differential mode signal that contains interference, the interference being reduced at a summer. By employing signal cancellation at a hybrid, interference within the circuit is cancelled earlier than in the cited prior art thereby reducing the propagation of interference within the circuit that potentially can be compounded. The cited prior art fails to disclose or suggest such a benefit.

Accordingly, for at least all the above reasons, claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

**Claims 2, 11 and 24 over Yeap in view of Bingel**

In the Office Action, claims 2, 11 and 24 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Yeap in view of Bingel et al., U.S. Patent No. 6,173,021 ("Bingel"). The Applicants respectfully traverse the rejection.

Claims 2, 11 and 24 are dependent on claims 1, 10 and 20 respectively, and are allowable for at least the same reasons as claims 1, 10 and 20.

Claim 2 recites, *inter alia*, an AM interference canceller that outputs a signal representative of AM interference to a hybrid. Claim 11 recites, *inter alia*, a hybrid summer to combine a signal destined for input to a DSL receiver with an output of an AM interference canceller module. Claim 24 recites, *inter alia*, combining a generated AM interference replica signal with a digital subscriber line signal at a hybrid.

As discussed above, Yeap fails to disclose a hybrid that receives and sums a cancellation signal, much less an AM interference cancellation signal, as recited by claims 2, 11 and 24.

The Office Action relies on Bingel to allegedly make up for the deficiencies in Yeap to arrive at the claimed invention. The Applicants respectfully disagree.

Bingel discloses a method and apparatus for eliminating or reducing local area and broad area interference in a twisted pair transmission pair (Abstract). A differential receiver within a DSL modem or other data communication device receives an analog signal from the twisted pair transmission line (Bingel, Fig. 1; col. 3, lines 36-53). An adder sums the output of the differential receiver and the output of a sampling scaling device to cancel interference (Bingel, Fig. 1; col. 3, lines 43-53).

Bingel discloses summing an output of a differential receiver and a sampling scaling device to reduce interference. Bingel's invention fails to disclose or suggest a hybrid circuit connected to a noise cancellation circuit, much less a hybrid that receives and sums an AM interference cancellation signal, as recited by claims 2, 11 and 24.

Moreover, if Yeap and Bingel were an obvious combination (which they are not), the theoretical combination would result in a interference cancellation system for a digital subscriber line that presents an interference cancellation signal to a summer receiving a signal from a hybrid circuit.

Neither Yeap nor Bingel, either alone or in combination, disclose, teach or suggest a hybrid that receives and sums an AM interference cancellation signal, as recited by claims 2, 11 and 24.

Accordingly, for at least all the above reasons, claims 2, 11 and 24 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

**Claims 6, 15, 19, 30 and 31 over Yeap in view of Bingel and Srinivasagopalan**

In the Office Action, claims 6, 15, 19, 30 and 31 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Yeap in view of Bingel, and further in view of Srinivasagopalan et al., U.S. Patent No. 4,689,804 ("Bingel"). The Applicants respectfully traverse the rejection.

Claims 6, 15, 19, 30 and 31 are dependent on claims 1, 10 and 20 respectively, and are allowable for at least the same reasons as claims 1, 10 and 20.

Claim 6 recites, *inter alia*, an AM interference canceller that outputs a signal representative of AM interference in a DSL front end to a hybrid. Claims 15 and 19 recite, *inter alia*, a hybrid summer to combine a signal destined for input to an DSL receiver with an output of an AM interference canceller module. Claim 30 and 31 recite, *inter alia*, combining a generated AM interference replica signal with a digital subscriber line signal at a hybrid.

As discussed above, neither Yeap nor Bingel disclose or suggest a signal cancellation signal being presented to a hybrid, much less an AM interference cancellation signal, as recited by claims 6, 15, 19, 30 and 31.

The Office Action relies on Srinivasagopalan to allegedly make up for the deficiencies in Yeap and Bingel to arrive at the claimed invention. The Applicants respectfully disagree.

Srinivasagopalan appears to disclose an apparatus for cancellation of sinusoidal varying phase jitter in a data modem (Abstract). An estimate of the frequency and phase of the phase jitter is computed in a first and second stage (Srinivasagopalan, Abstract). These estimates are combined to form a composite estimate of the phase jitter that are used to cancel out the sinusoidal phase jitter in a demodulator (Srinivasagopalan, Abstract).

Srinivasagopalan discloses reducing phase jitter in a conventional PBX data transmission, **NOT** a digital subscriber line. The Office Action alleges that Srinivasagopalan discloses locking onto a sinusoidal noise source, allegedly an AM carrier interference signal (Office Action, page 9). However, AM

interference only becomes prevalent in a PBX transmission medium when frequencies reach DSL proportions. Since AM interference is **NOT** a problem with conventional PBX data transmissions using conventional modems, Srinivasagopalan fails to disclose or suggest noise cancellation for a digital subscriber line, and therefore is non-analogous art with no suggestion of canceling AM interference in a digital subscriber line.

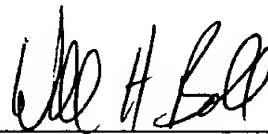
Neither Yeap, Bingel nor Srinivasagopalan, either alone or in combination, disclose, teach or suggest a hybrid that receives and sums an AM interference cancellation signal for a digital subscriber line, as recited by claims 6, 15, 19, 30 and 31.

Accordingly, for at least all the above reasons, claims 6, 15, 19, 30 and 31 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

### **Conclusion**

All objections and rejections having been addressed, it is respectfully submitted that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,  
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